

Appl. No : 10/060,842  
Filed : January 29, 2002

AMENDMENTS TO THE CLAIMS

The claims as listed below will replace all prior listings and presentations of claims in the above-identified application.

1. (CURRENTLY AMENDED) A field emission display device, comprising:
  - a faceplate and a baseplate;
  - a luminescent phosphor coating applied to a lower surface of the faceplate to form phosphorescent pixel sites; and
  - a cathode member formed on the baseplate to form individual electron-emission sites which emit electrons to activate the phosphors, the cathode member comprising:
    - a semiconductor layer overlying a substrate portion of the baseplate, the semiconductor layer including an emitter tip;
    - an aluminum layer surrounding the tip and incorporating nitrogen throughout the aluminum layer;
    - an insulating layer surrounding the tip and overlying the aluminum layer; and
    - a conductive layer surrounding the tip and overlying the insulating layer.
2. (ORIGINAL) The display device of Claim 1, wherein the conductive layer comprises a second aluminum layer incorporating nitrogen.
3. (ORIGINAL) The display device of Claim 1, wherein the cathode member further comprises a layer of grid silicon between the insulating layer and the conductive layer.
4. (ORIGINAL) The display device of Claim 1, wherein the aluminum layer comprises an atomic composition of about 2% - 10% nitrogen.
5. (ORIGINAL) The display device of Claim 1, wherein the aluminum layer comprises an atomic composition of about 5% - 8% nitrogen.
6. (ORIGINAL) The display device of Claim 1, wherein the aluminum layer has a resistivity of less than about 10  $\mu\Omega$  cm.
7. (ORIGINAL) The display device of Claim 1, wherein the aluminum layer has a surface roughness of about 300 Å to 400 Å.
8. (ORIGINAL) The display device of Claim 1, wherein the aluminum layer is substantially hillock-free.

Appl. No : 10/060,842  
Filed : January 29, 2002

9. (ORIGINAL) A field emission cathode, comprising:
  - a substrate;
  - an emitter tip formed on the substrate;
  - an aluminum film overlying said substrate and surrounding said emitter tip, said aluminum film including nitrogen throughout said film;
  - a gate layer formed above the aluminum film and surrounding said tip. [[.]]
10. (ORIGINAL) The cathode of Claim 9, wherein said gate layer comprises aluminum and nitrogen.
11. (ORIGINAL) The cathode of Claim 9, wherein the aluminum film comprises an aluminum nitride subphase.
12. (ORIGINAL) The cathode of Claim 9, further comprising a dielectric layer between the gate layer and the aluminum film.
13. (ORIGINAL) The cathode of Claim 12, further comprising a layer of grid silicon between the dielectric layer and the gate layer.
14. (ORIGINAL) The cathode of Claim 13, further comprising a semiconductor layer between the dielectric layer and the aluminum film.
15. (ORIGINAL) The cathode of Claim 14, wherein the aluminum film comprises an atomic composition of about 2% - 10% nitrogen.
16. (ORIGINAL) The cathode of Claim 15, wherein the aluminum film comprises an atomic composition of about 5% - 8% nitrogen.
17. (ORIGINAL) The cathode of Claim 15, wherein the aluminum film has a resistivity of less than about  $10 \mu\Omega \text{ cm}$ .
18. (ORIGINAL) The cathode of Claim 15, wherein the aluminum film has a surface roughness of about  $300 \text{ \AA}$  to  $400 \text{ \AA}$ .
19. (ORIGINAL) The cathode of Claim 15, wherein the aluminum film is substantially hillock-free.
20. - 30. (CANCELLED)
31. (NEW) A field emission display device, comprising:
  - a faceplate and a baseplate;

**Appl. No** : **10/060,842**  
**Filed** : **January 29, 2002**

a luminescent phosphor coating applied to a lower surface of the faceplate to form phosphorescent pixel sites; and

a cathode member formed on the baseplate to form individual electron-emission sites which emit electrons to activate the phosphors, the cathode member comprising:

a semiconductor layer overlying portion of the baseplate, the semiconductor layer including an emitter tip;

an aluminum layer surrounding the tip and incorporating an atomic composition of about 2% - 10% nitrogen;

an insulating layer surrounding the tip and overlying the aluminum layer; and

a conductive layer surrounding the tip and overlying the insulating layer.

32. (NEW) The display device of Claim 31, wherein the aluminum layer comprises an atomic composition of about 5% - 8% nitrogen.

33. (NEW) A field emission display device, comprising:

a faceplate and a baseplate;

a luminescent phosphor coating applied to a lower surface of the faceplate to form phosphorescent pixel sites; and

a cathode member formed on the baseplate to form individual electron-emission sites which emit electrons to activate the phosphors, the cathode member comprising:

a semiconductor layer overlying portion of the baseplate, the semiconductor layer including an emitter tip;

an aluminum layer surrounding the tip and incorporating nitrogen and having a surface roughness of about 300 Å to 400 Å;

an insulating layer surrounding the tip and overlying the aluminum layer; and

a conductive layer surrounding the tip and overlying the insulating layer.

34. (NEW) A field emission cathode, comprising:

a substrate;

an emitter tip formed on the substrate;

**Appl. No** : **10/060,842**  
**Filed** : **January 29, 2002**

an aluminum film overlying said substrate and surrounding said emitter tip,  
said aluminum film including an atomic composition of about 2% - 10% nitrogen;  
a gate layer formed above the aluminum film and surrounding said tip.

35. (NEW) The cathode of Claim 34, wherein the aluminum film comprises an  
atomic composition of about 5% - 8% nitrogen.

36. (NEW) A field emission cathode, comprising:  
a substrate;  
an emitter tip formed on the substrate;  
an aluminum film overlying said substrate and surrounding said emitter tip,  
said aluminum film including nitrogen and having a surface roughness of about 300 Å  
to 400 Å;  
a gate layer formed above the aluminum film and surrounding said tip.